

Message

---

**From:** Aubee, Catherine [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=18E81C76BBA145F1948ED5641919DEB1-AUBEE, CATHERINE]  
**Sent:** 7/11/2017 1:13:11 PM  
**To:** Tobias, David [Tobias.David@epa.gov]  
**CC:** Henry, Tala [Henry.Tala@epa.gov]; Doa, Maria [Doa.Maria@epa.gov]  
**Subject:** RE: GenX Risk Assessment Knowledge Gaps

Hi David,

Thanks for clarifying. Yes, please prepare a "cleaned up" explanation and run it by us before responding to Amy.

Best,  
Catherine

---

**From:** Tobias, David  
**Sent:** Tuesday, July 11, 2017 9:05 AM  
**To:** Aubee, Catherine <Aubee.Catherine@epa.gov>  
**Cc:** Henry, Tala <Henry.Tala@epa.gov>; Doa, Maria <Doa.Maria@epa.gov>  
**Subject:** RE: GenX Risk Assessment Knowledge Gaps

It was not a typo.

# Ex. 5 - Deliberative Process

-I took NC off this email, I can forward a cleaned up version of this to Amy if you want.-

David A. Tobias  
202.564.8534  
6334 P - WJC East  
Risk Assessment Division (RAD)  
Office of Pollution Prevention and Toxics (OPPT)  
My office hours : 8:30 am - 5:00 pm

---

**From:** Risen, Amy J [mailto:[Amy.Risen@dhhs.nc.gov](mailto:Amy.Risen@dhhs.nc.gov)]  
**Sent:** Tuesday, July 11, 2017 8:20 AM  
**To:** Aubee, Catherine <Aubee.Catherine@epa.gov>  
**Cc:** Henry, Tala <Henry.Tala@epa.gov>; Behl, Betsy <Behl.Betsy@epa.gov>; Strong, Jamie <Strong.Jamie@epa.gov>;  
Doa, Maria <Doa.Maria@epa.gov>; Tobias, David <Tobias.David@epa.gov>  
**Subject:** Re: GenX Risk Assessment Knowledge Gaps

Thank you for this. I do have a follow up question. You reported a BCF<3 and I wonder if that was a typo. Hoke et al reports a BCF<30 (BCF<3 for high concentrations and BCF<30 for low concentrations).

---

**From:** Aubee, Catherine <[Aubee.Catherine@epa.gov](mailto:Aubee.Catherine@epa.gov)>  
**Sent:** Monday, July 10, 2017 12:15:49 PM  
**To:** Risen, Amy J  
**Cc:** Henry, Tala; Behl, Betsy; Strong, Jamie; Doa, Maria; Tobias, David  
**Subject:** RE: GenX Risk Assessment Knowledge Gaps

*Internal deliberative – joint work product*

Hi Amy,

Thank you for sharing your meeting notes. We have a few clarifications that we'll send in a separate message. Meanwhile, here is the additional information that we discussed re: bioaccumulation potential.

Best,

Catherine

\*\*\*\*\*

Catherine Aubee

Chief – Assessment Branch 1 (Acting)

OPPT Risk Assessment Division

Email: [aubee.catherine@epa.gov](mailto:aubee.catherine@epa.gov)

Phone: (202) 564-0631

Office: WJC East 6221A

By Mail:

U.S. Environmental Protection Agency

1200 Pennsylvania Ave NW

- Estimating exposure potential due to fish consumption begins by assessing the potential for the build-up of a chemical in fish tissue relative to the concentration in the water. Laboratory test data for the accumulation in fish tissue based on long term exposures found that the ratio of the concentration of GenX in fish tissue to water, also known as the bioconcentration factor (BCF), was less than 3 (Hoke et al., 2016). This indicates long term exposures to GenX do not cause a significant buildup of the chemical in fish tissue and that long term exposures to GenX for people due to fish consumption would likely be significantly lower than drinking water exposures.
- Based on this BCF, GenX is considered to have a low bioaccumulation potential according to the EPA PBT Policy (U.S. EPA, 1999) and the Stockholm Convention (UNEP, 2009). The thresholds in these documents would require a BCF > 1000 or 5000 before a chemical became a concern for high bioaccumulation potential and these are significantly larger than those found for GenX.
- Per and polyfluoroalkyl substances (PFASs) have some properties which make them difficult to assess by traditional PBT classification schemes, but further evidence that the buildup of GenX will be lower than for PFOA (C8) comes from GenX having some properties that are more similar to shorter chain PFAS like PFHxA (C6).
  - GenX is more similar to smaller (or shorter chain length) PFAS (called C6 or C7) in molecular weight. Shorter chain PFAS have lower concern for fish tissue accumulation. Larger PFAS molecules (Above C9) have been found to accumulate in fish tissues.
  - GenX is not well removed from drinking water by activated carbon (Sun, 2016) which is similar to the shorter chain PFAS chemicals like C6. PFOA and longer chain PFAS in general have been found to have a better potential for drinking water treatment by activated carbon (Rahman 2014). This indicates that GenX may be less “sticky” to carbon than the PFAS that have been found to be a concern for fish bioaccumulation.
- The rate at which GenX is eliminated from the body after exposure has been measured in rats, mice and monkeys. These studies indicate that the elimination of GenX in all three organisms is relatively fast and it is not retained in body tissues (Gannon, 2016). This is substantially different than for some other perfluorinated chemicals, like PFOA, which is retained in monkeys and humans for significantly longer than in rodents (Lau, 2012). This is NOT the case for GenX; the retention in rodents and monkeys are about the same. This indicates that there is not a large difference among species in how quickly GenX may be cleared from the body and its behavior is different than PFOA. Although this is mammalian data, it is another indication that GenX has a lower tendency to accumulate in tissues than some other PFASs.

Gannon, SA; Fasano WJ; Mawn MP; Nabb DL; Buck RC; Buxton LW; Jepson GW; Frame SR (2016) Absorption, distribution, metabolism, excretion, and kinetics of 2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)propanoic acid ammonium salt following a single dose in rat, mouse, and cynomolgus monkey Toxicology 340: 1-9.

Hoke, RA; Ferrell, BD; Sloman, TL; Buck, RC; Buxton, LW. (2016) Aquatic hazard, bioaccumulation and screening risk assessment for ammonium 2, 3, 3, 3-tetrafluoro-2-(heptafluoropropoxy)-propanoate. Chemosphere 149: 336-342.

Lau, C. 2012 *Perfluorinated compounds*. Molecular Clinical and Environmental Toxicology. Vol. 3: Environmental Toxicology, ed. A. Luch, Birkhäuser-Verlag, Basel Switzerland, pp. 47-86.

Rahman, MF; Peldszus, S; Anderson, WB. (2013) Behaviour and fate of perfluoroalkyl and polyfluoroalkyl substances (PFASs) in drinking water treatment: A review. Water Research 50: 318-340.

UNEP (United Nations Environment Programme). (2009) Stockholm Convention on Persistent Organic Pollutants. Annex D. <http://chm.pops.int/TheConvention/Overview/TextoftheConvention/tabid/2232/Default.aspx>

U.S. EPA (U.S. Environmental Protection Agency). (1999). Category for persistent, bioaccumulative, and toxic new chemical substances. Fed Reg 64: 60194-60204.

David A. Tobias

202.564.8534

6334 P - WJC East

Risk Assessment Division (RAD)

Office of Pollution Prevention and Toxics (OPPT)

My office hours : 8:30 am - 5:00 pm

---

Email correspondence to and from this address is subject to the North Carolina Public Records Law and may be disclosed to third parties by an authorized State official. Unauthorized disclosure of juvenile, health, legally privileged, or otherwise confidential information, including confidential information relating to an ongoing State procurement effort, is prohibited by law. If you have received this email in error, please notify the sender immediately and delete all records of this email.